



October 22, 2018

**Ex Parte**

Marlene H. Dortch, Secretary  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Washington, D.C. 20554

Re: *International Bureau Seeks Comment on Recommendations Approved by World Radiocommunication Conference Advisory Committee*, IB Docket No. 16-185

Dear Ms. Dortch:

On October 19, 2018, Facebook's Monica Desai, Director of Public Policy and Michael Tseytlin, Director of Engineering, and Tricia Paoletta, of Harris, Wiltshire & Grannis LLP met telephonically with Rachael Bender, Wireless and International Advisor to Chairman Pai to discuss Facebook's compromise recommendation for a U.S. Proposal for High-Altitude Platform Stations (HAPS), under Agenda Item 1.14 for next year's World Radiocommunication Conference (WRC-19). On October 18<sup>th</sup>, Ms. Desai, Mr. Tseytlin, and Ms. Paoletta met with Will Adams, Wireless and International Legal Advisor to Commissioner Carr, and later with Umair Javed, Wireless and International Legal Advisor to Commissioner Rosenworcel, to discuss the same compromise.

During the meetings, Facebook encouraged the Commission to champion a proposal in reconciliation with NTIA that includes the 21.5-22 GHz, 24.25-27.25 GHz, 28/31 GHz, and 38-39.5 GHz bands, with directionality and appropriate pfd and EIRP levels on HAPS that protects federal and commercial incumbent services. A summary of this proposal is attached in chart form to this ex parte.

Facebook's mission is to give people the power to build community and bring the world closer together, and one of the ways it has been doing this is by pioneering new technologies to bring affordable connectivity to more people faster. Facebook invested in proving HAPS technology as one potential way to connect people in rural areas who do not have broadband Internet. A HAPS is a radio station that operates at approximately 20 km (12 miles) above the ground, at a nominally fixed position relative to the ground, providing about a 100 km diameter coverage area. Facebook is neither a HAPS manufacturer nor an operator, but has invested in this technology which can be used by both mobile and satellite operators to provide more affordable broadband. Facebook has been collaborating with Airbus and other HAPS companies to advance spectrum and aviation policy to demonstrate the viability of HAPS systems for providing broadband connectivity in the bands considered by the ITU.



The Commission is currently deciding what its position should be for outstanding U.S. Proposals on the WRC-19 agenda items, going into the upcoming CITEL PCC.II meeting. At the last CITEL PCC.II meeting, a Draft Inter-American Proposal was adopted by our neighbors for HAPS in the 24.25-27.5 GHz and 38-39.5 GHz bands and a Preliminary Proposal was contributed by Mexico for the 21.4-22 GHz band. Facebook is pleased that other members of the industry, including those in the HAPS, mobile and satellite industry, have supported most of these bands for HAPS identifications. To lead in CITEL in new technology adoption, as well as to demonstrate that the U.S. shares its Region's goals of closing the digital divide in underserved areas, Facebook believes the Commission should champion a proposal that bridges these bands, and goes further to support modifying the existing HAPS identification in the 28/31 GHz band to be accessible in our CITEL Region.

Facebook proposes the following compromise to bring the various industry Views together, as reflected in the attached chart:

- 21 GHz: To protect a federal mobile system, begin the range at 21.5 GHz, rather than 21.4 GHz.
- 47 GHz: Agree to the satellite View (View D) for a No Change proposal for the existing global HAPS identification in the 47 GHz band.
- a pfd mask that reflects the need for consistency between agenda items 1.5, 1.13 and 1.14.
- Include the directionality requested of satellite and mobile operators, and federal incumbents.

Facebook explained that given its goals of supporting affordable broadband backhaul, it recommends identifications of HAPS and IMT in the same bands in order to make HAPS use of the 26 and 38 GHz bands in rural markets affordable, through scale economies for the chips and other broadband components. Brazil, which led development of the Draft Inter-American Proposal for HAPS in the 26 GHz and 38 GHz bands, also led development of a Draft Inter-American Proposal for IMT in the 26 GHz band and proposed IMT in the 38 GHz band. Brazil had done sharing studies for HAPS, satellite and mobile co-existence, and was satisfied that with appropriate mitigation, IMT, satellite and HAPS could share the bands.

Sincerely,

/s/Michael Tseytlin

Michael Tseytlin  
**Facebook, Inc.**  
1 Hacker Way  
Menlo Park, CA 94025



cc: Rachael Bender  
Will Adams  
Umair Javed  
Thomas Sullivan  
Michael Mullinix

Attachment: reviewed slides





# ***HAPS Update***

Facebook

# Facebook spectrum policy principles

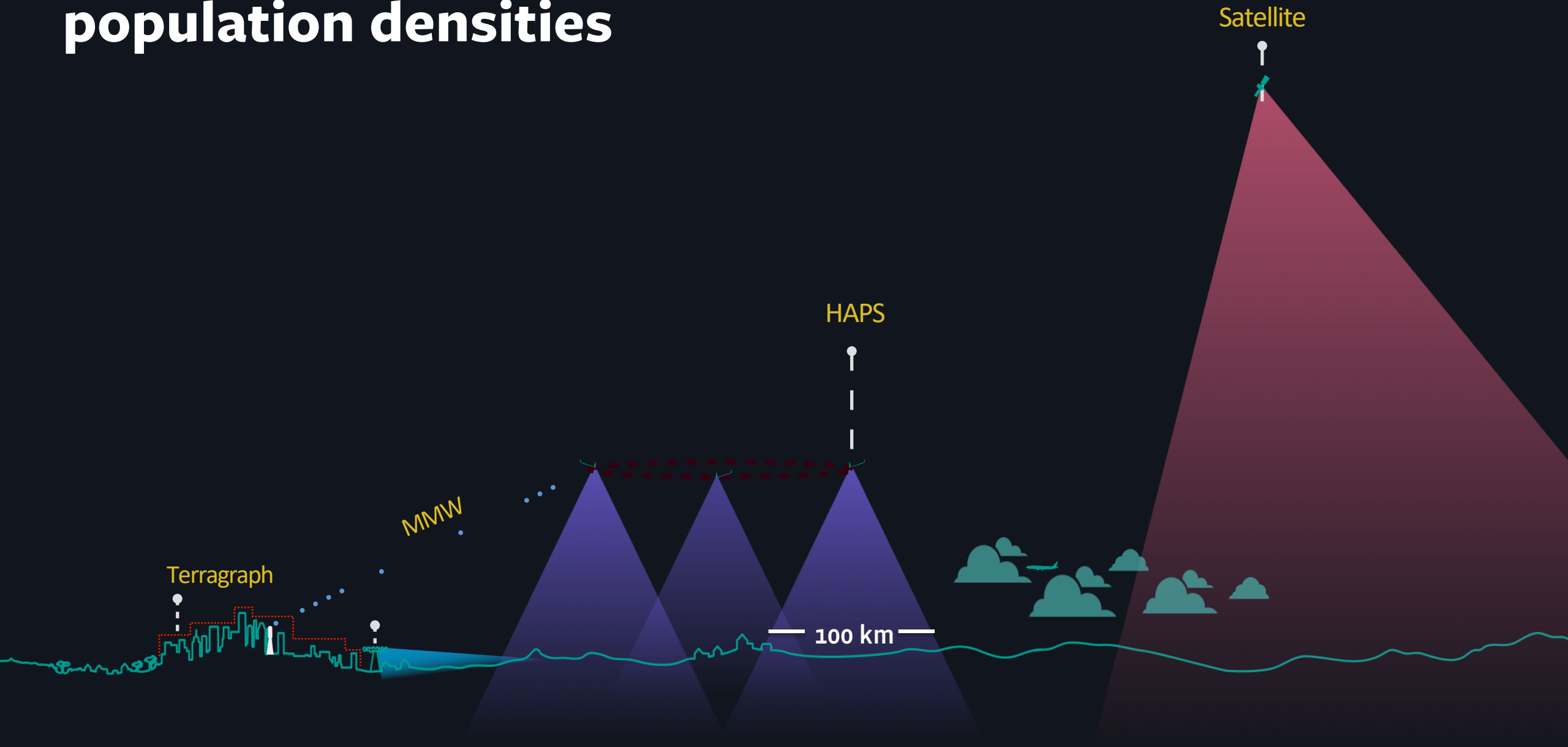
- ***Ensure an abundant supply of spectrum.*** Influence abundance of worldwide spectrum to reduce service provider barriers to entry and increase competition and innovation. Influence international and national spectrum authorities to identify additional harmonized spectrum in all bands.
- ***Promote flexible use.*** Pursue flexible use of spectrum — including spectrum sharing — across users and platforms, such as mobile, satellite, and aerial platforms (HAPS) with the goal of significantly increasing spectrum available for broadband.
- ***Balance licensed and unlicensed spectrum.*** Support global harmonization for and balanced regulatory regime between licensed and unlicensed spectrum to support the build out of large and densely populated areas while facilitating low cost broadband access with economies of scale for chipsets and devices.

# Balanced spectrum policy principles

***Promote both the capacity and coverage of networks.*** Spectrum authorities should pursue policies that not only enhance capacity of networks but also expand their coverage to underserved areas.

- ✓ Make buildout requirements effective (clear consequences to missing build-out requirements, ID secondary licensees upfront, use or share)
- ✓ Determine auction winners based on speed of buildout rather than bid price alone
- ✓ Make access to urban spectrum contingent on some level of rural network buildout
- ✓ Make more spectrum available for innovative backhaul approaches

# Connectivity platforms to serve different population densities





# Technological advances enabling high altitude platform stations (HAPS)

- ✓ Li-ion batteries
- ✓ High efficiency solar panels
- ✓ Lightweight materials
- ✓ Autonomous aircraft avionics



# PROPOSED HAPS IDENTIFICATIONS

Spectrum Bands (GHz)	NTIA	Satellite	Mobile	Lockheed Martin	CITEL	Proposed Compromise
21.4-22	NOC	*		21.5-22 Uplink	Mexico	21.5-22 GHz Downlink
24.25-24.75	NOC			**	Draft Inter-American Proposal	Downlink
24.75-25.25					Draft Inter-American Proposal	Downlink
25.25-27.0	NOC 25.5-27			Downlink	Draft Inter-American Proposal	Uplink
27-27.5			Downlink	Downlink	Draft Inter-American Proposal	Downlink
28		+	Global Downlink			Downlink
31			Global Uplink			Downlink
38-39.5		NOC	Global		Draft Inter-American Proposal	Uplink
47/48		NOC	Global, Uplink			NOC

\* green Indicates Support for HAPS identification

\*\*light green - Lockheed Martin's Cover to View C states open to merging its proposal with other bands

+ pink - SES comments state open to proposal if satisfied on mobile pfd.